

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: John B. Hoeflich, et al.

Serial No.: 08/787,745

Filed: January 24, 1997

For: **HIGHER OVERALL FLEX GOLF SHAFT**

Attorney Docket No.: HDG 2 012-1

Group Art Unit: 3711

Examiner: S. Blau



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#23
X, Cobb
1/17/01

Assistant Commissioner of Patents
Washington, D. C. 20231

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TRANSMITTAL OF BRIEF OF APPELLANTS

Dear Sir:


In connection with the above-entitled case, please apply the enclosed remittance in payment of Patent and Trademark Office fees in the amount and for the purpose below indicated:

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Respectfully submitted,

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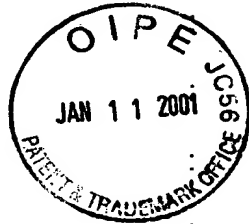
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Georgeen B. George

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PATENT

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APPELLANTS BRIEF UNDER 37 C.F.R. §1.192

Assistant Commissioner for Patents
Washington D. C. 20231

Dear Sir:

This is an appeal to the Board of Appeals from the final rejection in the Official Action of May 4, 2000 of claims 1-3, 5-9, and 11-21 of the subject application.

I. Real Party in Interest

The subject application is owned by H.D. Golf Development, Inc. by virtue of an assignment from the inventors.

II. Related Appeals and Interferences

This application is not the subject of any related appeals or interferences.

III. Status of the Claims

Claims 1-3, 5-9, and 11-21, all the claims remaining in the present application, have been finally rejected in the Office Action dated

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May 4, 2000. A correct copy of claims 1-3, 5-9, and 11-21 appears in the appendix attached hereto.

IV. Status of the Amendments

No amendments have been submitted after the final rejection of May 4, 2000.

V. Summary of the Invention

The present invention is directed to a golf club shaft comprising an elongated tubular shaft constructed of a plurality of layers of fibers embedded in a synthetic resin. The elongated tubular shaft has a butt end of relatively larger cross section diameter of .400 to .540 inches, which tapers without intervening discontinuities to a tip end having an outside diameter between .330 and .400 inches (claims 1 and 21; page 6, line 1 through page 7, line 28). In a preferred form, the golf club shaft transitions without intervening discontinuities from a butt end of .400 to .540 inches to a tapered intermediate section, which transitions to a relatively smaller tip end having an outside diameter of between .330 and .400 inches (claims 7, 13, and 19; page 6, line 11 through page 7, line 28). Most preferably, the golf club shaft has a length of 35-47 inches (claims 3, 9, and 18; page 8, lines 4-5). In a particular preferred form, the golf club shaft is comprised of two inner layers of graphite fibers embedded in epoxy, where the inner layers have fibers oriented at $+45^{\circ}$ and -45° relative to the axis of the shaft, and an intermediate layer of graphite fibers embedded in epoxy, where the graphite fibers are oriented longitudinal to the axis of the shaft (claims 5, 6, 11, and 12; page 6, line 19 through page 7, line 20). The golf club shaft having a butt end diameter of .400 inches to .540 inches coupled with a tip end diameter of .330 inches to .400 inches exhibits a more uniform bend profile in conjunction with a higher overall kick point (Figures 10-11).

VI. Issues

1. Whether claims 1-3 are properly rejected under 35 U.S.C. §102(b) as being anticipated by Akatsuka (U.S. 5,437,450)?

2. Whether claim 5 is properly rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka (U.S. 5,437,450) as applied to claims 1-3, and further in view of Hogan (U.S. 5,308,062)?

3. Whether claim 6 is properly rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka (U.S. 5,437,450) as applied to claims 1-3, and further in view of Hogan (U.S. 5,308,062) and Akatsuka (U.S. 5,156,396)?

4. Whether claims 7-9, 11, 13-16, and 18 are properly rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka (U.S. 5,437,450) in view of Hogan (U.S. 5,308,062) and Iwanaga (4,725,060)?

5. Whether claim 12 is properly rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka (U.S. 5,437,450) in view of Hogan (5,308,062) and Iwanaga (U.S. 4,725,060), and further in view of Akatsuka (U.S. 5,156,396)?

6. Whether claim 17 is properly rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka (U.S. 5,437,450) in view of Hogan (5,308,062) and Iwanaga (U.S. 4,725,060), and further in view of Huang (U.S. 5,571,051)?

7. Whether claims 19-20 are properly rejected under 35.U.S.C. §103(a) as being unpatentable over Akatsuka (U.S. 5,437,450) in view of Hogan (5,308,062)?

8. Whether claim 21 is properly rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka (U.S. 5,437,450) in view of Iwanaga (4,725,060)?

VII. Grouping of the Claims

Claims 1-3; 5; 6; 7-9, 11, 13-16, and 18; 12; 17; 19-20; and 21 stand separately in view of the separate rejections. The following argument further sets forth the distinctive elements of the claims and the basis for separate consideration of each.

VIII. Argument

Issue 1

Claims 1-3 are rejected under 35 U.S.C. §102(b) as being anticipated by Akatsuka ('450). The Examiner states that Akatsuka ('450) discloses all of the claim structure, including an outside butt diameter in the range of .492 inches - .728 inches and an outside tip diameter in the range of .173 inches - .488 inches. These ranges are to be compared with the claimed outside butt diameter range of .400 inches - .540 inches and the claimed outside tip diameter range of .330 inches - .400 inches. In dealing with ranges, "[w]hen the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation." MPEP 2131.03. In this case, Akatsuka ('450) discloses ranges which are exceptionally broad in comparison to those practiced in the industry (see Olsavsky Affidavit, paragraph 10). Further, the Akatsuka ('450) reference does not provide a single example of a shaft having butt and tip diameters within the claimed ranges. More particularly, Akatsuka

(‘450) provides a first exemplary shaft having an outside butt diameter of .591 inches, which is outside the claimed range, and an outside tip diameter of .335 inches, which is at the bottom of the claimed range (see Akatsuka specification, col. 8, lines 34-37). Akatsuka (‘450) provides a second exemplary shaft having an outside tip diameter of .189 inches, which is far outside of the claimed range, and an outside butt diameter of .524 inches, which is at the very top of the claimed range (see Akatsuka specification, col. 9, lines 18-21). Therefore, Akatsuka (‘450) does not provide a specific example falling within the claimed ranges.

In fact, Akatsuka (‘450) is consistent in its variations of tip and butt diameter. In other words, as illustrated in the first exemplary shaft, a larger butt diameter is accompanied by a larger tip diameter, with the butt diameter being outside of the claimed range. Conversely, as illustrated in the second exemplary shaft, a smaller butt diameter is accompanied by a smaller tip diameter, with the tip diameter being outside of the claimed range. This consistency in tip and butt diameter variations leads to one end of the golf shaft being outside of the claimed range. The fact that either the butt end or tip end of the golf shaft falls within the claimed range is mere happenstance.

“In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with ‘sufficient specificity to constitute an anticipation.’” MPEP 2131.03. In the present case, the claimed butt and tip diameter ranges are narrow in comparison to the overly broad ranges disclosed in the Akatsuka reference (see Olsavsky Affidavit, paragraph 10). In fact, Appellants note that the closest possible point of overlap with the presently claimed butt diameter is only achieved by selecting the minimum possible inside diameter of the club shaft and the minimum wall thickness of the shaft. In this regard, Akatsuka (‘450) includes an extremely broad range for these characteristics and does not disclose them with sufficient specificity. In fact, Akatsuka (‘450) teaches that it is preferable to have a

butt end diameter between .547 inches - .649 inches, completely outside of the claimed range.

Further, if the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, it may be reasonable to conclude that the broad range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. MPEP 2131.03. In fact, the unexpected results may also render the claims unobvious. MPEP 2131.03; MPEP 2144.05. There is evidence of unexpected results within the claimed range, namely, a higher kick point and a more uniform bend profile for the shaft (see Figure 10 and Figure 11 of the specification; Olsavsky Affidavit at paragraph 7; Hoeflich Affidavit at paragraphs 10-11). Accordingly, Akatsuka ('450) does not disclose the claimed butt and tip diameter ranges with sufficient specificity to constitute anticipation under 35 U.S.C. §102(b).

Similarly, the claimed invention is unobvious in light of Akatsuka ('450). Appellants note that patentability may exist notwithstanding overlapping ranges. MPEP 2144.05. Moreover, patentability arises when criticality is established by a certain range. In this regard, Appellants' invention demonstrates a superior function as a result of the reduced butt end diameter of the shaft. As shown in Figures 10 and 11, paragraphs 7 and 8 of the Olsavsky Affidavit, and paragraphs 8-11 of the Hoeflich Affidavit, such a difference in butt end diameter, coupled with a larger tip end diameter, results in considerably greater shaft flex in the butt portion of the shaft as well as a kick point considerably closer to the butt end of the shaft, both of which are highly desirable.

Based on the two disclosed examples in Akatsuka ('450) and the extremely broad ranges, Akatsuka ('450) does not suggest combining a tip at the high end of the range of preferred tip thicknesses with a butt at the low end of the range of preferred butt thicknesses in order to move the kick point of the shaft higher. In fact, by teaching a preferred butt end diameter of .547 inches - .649 inches together with a preferred tip end

diameter of .252 inches to .370 inches, Akatsuka ('450) teaches away from the claimed invention.

Issue 2

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka ('450) as applied to claims 1-3, and further in view of Hogan. Appellants reassert that a significant limitation in the present claim language (claim 1) is the requirement that the butt end have a diameter between .400 inches - .540 inches, while the tip end have a diameter between .330 inches - .400 inches. In this regard, the Examiner has relied on the Akatsuka ('450) broad ranges for both butt end and tip end diameters. In fact, Akatsuka ('450) teaches that it is preferable to have a butt end having a thickness of .547 inches - .650 inches and a tip end having a thickness of .252 inches - .370 inches. Further, the two examples discussed in Akatsuka ('450) do not suggest combining a tip at the high end of the range of preferred tip thicknesses with a butt at the low end of the range of preferred butt thicknesses in order to move the kick point of the shaft higher.

The Examiner refers to Hogan for its teaching of a shaft made with graphite fibers in order to have a stronger shaft for a stronger player who swings a club faster. The addition of the teachings in Hogan, referred to by the Examiner, add nothing to the deficiencies in Akatsuka ('450). Moreover, Hogan does not teach or suggest combining a tip at the high end of the range of preferred tip thicknesses with a butt at the low end of the range of preferred butt thicknesses in order to move the kick point of the shaft higher. Therefore, Appellants assert that a prima facie case of obviousness has not been established.

Issue 3

Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka ('450) as applied to claims 1-3, and further in

view of Hogan and Akatsuka ('396). Appellants incorporate herein the arguments set forth in Issue 1 and Issue 2. Namely, because of the overly broad butt end and tip end ranges in Akatsuka ('450), coupled with the fact that Akatsuka ('450) provides preferred examples teaching away from a shaft within the claimed ranges, and fails to recognize the criticality of the butt and tip end ranges in the present invention (claim 1), claim 6 distinguishes patentably over the prior art.

The Examiner refers to Hogan for its teaching of a shaft made with graphite fibers and to Akatsuka ('396) for its teaching of a shaft having an intermediate and outer layer embedded in epoxy and fiber being oriented longitudinal to the axis of the shaft. However, neither of these teachings add anything to the deficiencies in Akatsuka ('450) with respect to the overall shaft dimensions.

Issue 4

Claims 7-9, 11, 13-16, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka ('450) in view of Hogan and Iwanaga. Akatsuka, via its preferred ranges of a butt end diameter of .547 inches to .649 inches and a tip end diameter of .252 inches to .370 inches, teaches away from the present invention. In fact, Akatsuka does not provide a single example of a shaft having butt and tip end diameters within the claimed ranges.

Akatsuka's first example teaches a golf club shaft having an outside butt diameter of .591 inches, which is outside of the claimed range, and an outside tip diameter of .335 inches, which is at the very bottom of the claimed range (Akatsuka specification, col. 8, lines 34-37). Akatsuka provides a second example teaching a golf club shaft having an outside tip diameter of .189 inches, which is far outside the claimed range, and an outside butt diameter of .524 inches, which is at the very top of the claimed range (Akatsuka specification, col. 9, lines 18-21). Therefore, Appellants submit that there is no suggestion in the Akatsuka ('450) reference to

combine a smaller diameter butt end with a tip end of conventional or larger diameter in order to move the kick point of the shaft higher.

Even if the Examiner maintains that obviousness is established, it is evidenced by the Olsavsky Declaration at paragraphs 6-8 that moving a kick point higher by a decrease in the butt diameter of a shaft is unexpected.

The Examiner relies on Hogan for the teaching that “it would have been obvious to have a butt end, intermediate section, and a tip end as defined by the claims in order to have a *lower kick point* compared to a uniform tapered shaft to obtain more elevation when hitting a ball for the same swing by having a *stiffer butt end* and a *more flexible tip end*.” (Emphasis added). In other words, the Examiner contends that Hogan teaches creating a stronger or stiffer butt end to induce flexure in the central and lower portions of the shaft. In contrast, Appellants claim a golf club shaft having a more flexible, smaller diameter butt end coupled with a stiffer larger diameter tip end, which has a *higher kick point*. By the Examiner’s own admission, Hogan teaches away from the Appellants’ invention.

The Examiner relies on Iwanaga for the teaching that “it would have been obvious to modify the shaft of Akatsuka to have a kick point above the center point of a shaft to provide a shaft for a *club with a greater number* which requires a more controlled swing for exact drop point of a ball.” (Emphasis added). In other words, the Examiner points out that Iwanaga teaches a higher kick point for a club with a *greater number*, i.e. higher numbered clubs, such as 7, 8, and 9-irons. In fact, Table 1 of Iwanaga illustrates that the kick point of the shaft is only above the center point of the shaft for the 8-iron and 9-iron, while the kick point of the shaft is *below the center point* for the W1, W3, W4, W5, I3, I4, I5, I6, and I7 clubs, i.e. the longer shafted clubs. At column 5, lines 30-31, Iwanaga teaches “the longer of the shafts is *more flexible on the head side* than on the grip side to *give a lower kick point*.” Therefore, Iwanaga contains no

teaching of a golf club shaft having a length between 35 inches and 47 inches, i.e. the longer shafted clubs, with a flex point above the center point of the shaft.

A true reading of Iwanaga reveals that it teaches away from the claimed invention. Iwanaga teaches that a kick point of a golf club shaft may be located above the center point of the shaft by introducing a *discontinuity* in the filament winding angle of an intermediate section of the shaft (Iwanaga, col. 3, lines 20-40). More particularly, Iwanaga teaches an intermediate section of a golf club shaft having a filament winding angle between 5 degrees and 30 degrees, significantly larger than the winding angles of the grip- and head-side sections of the shaft. The introduction of an intentional discontinuity in the Iwanaga shaft leaves it improperly combinable with Akatsuka '450, which teaches constant filament winding angles of $+45^{\circ}$ and -45° . Further, the discontinuity in winding angle teaches away from the more uniform bend profile and higher kick point brought about by the reduced butt diameter coupled with a conventional tip diameter present in Appellants' golf club shaft.

Issue 5

Claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka ('450) in view of Hogan and Iwanaga as applied to claims 7-9, 11, 13-16, and 18, and further in view of Akatsuka ('396). Appellants reassert that a significant limitation in the present claim language (claim 7) is the requirement that the butt end have a diameter between .400 inches - .540 inches, while the tip end have a diameter between .330 inches - .400 inches. In this regard, the Examiner has relied on the Akatsuka ('450) broad ranges for both butt end and tip end diameters. In fact, Akatsuka ('450) teaches that it is preferable to have a butt end having a thickness of .547 inches - .650 inches and a tip end having a thickness of .252 inches - .370 inches. Further, the two examples discussed in Akatsuka ('450) do not suggest combining a tip at the high end

of the range of preferred tip thicknesses with a butt at the low end of the range of preferred butt thicknesses in order to move the kick point of the shaft higher.

The Examiner refers to Hogan for its teaching of a shaft made with graphite fibers in order to have a stronger shaft for a stronger player who swings a club faster. The addition of the teachings in Hogan, referred to by the Examiner, add nothing to the deficiencies in Akatsuka ('450). Therefore, Appellants assert that a prima facie case of obviousness has not been established.

Issue 6

Claim 17 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka ('450) in view of Hogan and Iwanaga, and further in view of Huang. First, Appellants note that claim 17 requires a golf club shaft with a butt end diameter of between .450 and .475 inches, which is completely outside the range of .492 - .728 inches disclosed in Akatsuka '450.

The Examiner relies on Huang for its teaching that it is desirable to have a profile of a *grip* and shaft to assume the configuration corresponding to the size and shape of a golfer's hand. However, the Examiner's reliance on Huang is misplaced. Moreover, Huang teaches away from the present invention by teaching that one skilled in the art should vary the longitudinal profile of *the grip* in order to account for players with hands of different sizes. In other words, there is *no suggestion* to narrow the butt end shaft diameter in Huang. In col 1, lines 26-30, Huang states "[i]t is therefore desirable to be able to vary the longitudinal profile of a golf club *grip* to meet the desires of any particular golfer, i.e., a person with small hands usually obtains better results with a *grip* of reduced diameter as compared to a person with large hands." (Emphasis added).

The Examiner appears to ignore this teaching in Huang, stating that "it is intuitive that one of the most important consideration [sic]

for selecting a size of diameter of a butt end of a shaft is consideration with respect to the size of a player's hand." Appellants reaffirm that those of ordinary skill in the art adjust the grip (i.e. the elastomeric fitting which sheaths the shaft) diameter, rather than the shaft diameter, in order to accommodate players with hands of differing sizes (Olsavsky Declaration, paragraph 12).

Issue 7

Claim 19-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka ('450) in view of Hogan. Appellants reassert that a significant limitation in the present claim language (claim 19) is the requirement that the butt end have a diameter between .400 inches - .560 inches, while the tip end have a diameter between .330 inches - .400 inches. In this regard, the Examiner has relied on the Akatsuka ('450) broad ranges for both butt end and tip end diameters. In fact, Akatsuka ('450) teaches that it is preferable to have a butt end having a thickness of .547 inches -.650 inches and a tip end having a thickness of .252 inches - .370 inches. Further, the two examples discussed in Akatsuka ('450) do not suggest combining a tip at the high end of the range of preferred tip thicknesses with a butt at the low end of the range of preferred butt thicknesses in order to move the kick point of the shaft higher.

The Examiner refers to Hogan for its teaching of a shaft made with graphite fibers in order to have a stronger shaft for a stronger player who swings a club faster. The addition of the teachings in Hogan, referred to by the Examiner, add nothing to the deficiencies in Akatsuka ('450). Therefore, Appellants assert that a prima facie case of obviousness has not been established.

Issue 8

Claim 21 is rejected under 35 U.S.C. §103(a) as being unpatentable over Akatsuka ('450) in view of Iwanaga. Appellants reassert that a significant limitation in the present claim language (claim 21) is the requirement that the butt end have a diameter between .400 inches - .540 inches, while the tip end have a diameter between .330 inches - .400 inches. In this regard, the Examiner has relied on the Akatsuka ('450) broad ranges for both butt end and tip end diameters. In fact, Akatsuka ('450) teaches that it is preferable to have a butt end having a thickness of .547 inches - .650 inches and a tip end having a thickness of .252 inches - .370 inches. Further, the two examples discussed in Akatsuka ('450) do not suggest combining a tip at the high end of the range of preferred tip thicknesses with a butt at the low end of the range of preferred butt thicknesses in order to move the kick point of the shaft higher.

The Examiner relies on Iwanaga for the teaching that it would have been obvious to modify the shaft of Akatsuka to have a kick point above the center point of a shaft to provide a shaft for a club with a greater number. In fact, Iwanaga teaches "the longer of the shafts is *more flexible on the head side* than on the grip side to *give a lower kick point*." Therefore, Iwanaga contains no teaching of a golf club shaft having a length between 35 inches and 47 inches with a flex point above the center point of the shaft. Further, Iwanaga teaches that a kick point of a golf club shaft may be located above the center point of the shaft in shorter clubs by introducing a *discontinuity* in the filament winding angle of an intermediate section of the shaft. The introduction of an intentional discontinuity in the Iwanaga shaft leaves it improperly combinable with Akatsuka '450. The addition of the teachings in Iwanaga, referred to by the Examiner, add nothing to the deficiencies in Akatsuka ('450). Therefore, Appellants assert that a prima facie case of obviousness has not been established.

IX. Summary

In view of the above, Appellants submit that the broad Akatsuka '450 ranges for shaft dimensions do not anticipate the narrower and not fully encompassed ranges presently claimed. Furthermore, Akatsuka '450 teaches away from the present invention. Appellants contend that there is no suggestion in the Akatsuka '450 reference to combine a smaller diameter butt end with a tip end of conventional or larger diameter in order to move the kick point of the shaft higher. Iwanaga teaches away from the present invention by teaching moving a kick point above a center point only in shorter clubs by introducing an intentional discontinuity into the shaft via filaments of varying winding angle. Finally, even if the Examiner maintains that obviousness is established, it is evidenced by the Olsavsky Declaration that moving a kick point higher by a decrease in the butt diameter of a shaft is unexpected. This result, to which Akatsuka and Iwanaga are completely silent, rebuts any established prima facie case of obviousness.

Accordingly, Appellants respectfully request that the Examiner's rejection of each of claims 1-3, 5-9, and 11-21 be reversed.

Respectfully submitted,

FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP



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I hereby certify that this **APPELLANTS BRIEF** is being deposited with the United States Postal Service as first class mail in an envelope addressed to Assistant Commissioner for Patents, Washington, D.C. 20231, on January 8, 2001.

By: _____


Georgeen B. George

APPENDIX

1. A golf club shaft comprising:
an elongated tubular shaft comprising a plurality of layers of fibers imbedded in a synthetic resin, said elongated tubular shaft having a butt end of relatively larger cross sectional diameter tapering without intervening discontinuities to a tip end of relatively smaller diameter, said tip end having an outside diameter between .330 and .400 inches;
said butt end having an outside diameter of .400 to .540 inches.
2. The golf club shaft of claim 1, wherein:
said butt end has a wall thickness of between .04 and .045 inches.
3. The golf club shaft of claim 1, wherein:
a length of the shaft is from about 35-47 inches.
5. The composite golf club shaft of claim 1, further comprising:
two inner layers of graphite fibers embedded in epoxy, said inner layers having fibers oriented an angles of $+45^{\circ}$ and -45° respectively relative to the axis of the shaft.
6. The composite golf club shaft of claim 1, further comprising:
an intermediate layer of graphite fibers embedded in epoxy, said graphite fibers being oriented longitudinal to the axis of the shaft.
7. A composite golf club shaft comprising:
an elongated tubular shaft comprising a plurality of layers of fiber embedded in a synthetic resin, said elongated tubular shaft having a butt end comprising a substantially cylindrical cross section of relatively

larger cross section, which transitions without intervening discontinuities to a tapered intermediate section, said tapered intermediate section tapering without intervening discontinuities to a relatively smaller diameter tip end, said tip end having an outside diameter of between .330 and .400 inches; said butt end having an outside diameter between .400 to .540 inches, said butt end diameter displacing a kick point above a center pint of the composite golf club shaft.

8. The golf club shaft of claim 7, wherein:
said butt end has a wall thickness between .04 and .045 inches.

9. The golf club shaft of claim 7, wherein:
the golf club shaft has a length between 35 and 47 inches.

11. The composite golf club shaft of claim 7, further comprising:
two inner layers of graphite fibers embedded in epoxy, said inner layers having fibers oriented at angles of $+45^\circ$ and -45° respectively relative to the axis of the shaft.

12. The composite golf club shaft of claim 7, further comprising:
an intermediate layer of graphite fibers embedded in epoxy, said graphite fibers being oriented longitudinal to the axis of the shaft.

13. A composite golf club shaft comprising:
an elongated tubular shaft comprising a plurality of layers of fiber embedded in a synthetic resin, said elongated tubular shaft having a butt end comprising a substantially cylindrical cross section of relatively larger cross section having an outside diameter between .400 and .540 inches, which transitions without intervening discontinuities to a tapered intermediate section, said tapered intermediate section transitioning without

intervening discontinuities to a relatively smaller diameter tip end, said tip end having an outside diameter adapted to be fitted to the hosel of a club head, said butt end diameter displacing a kick point above a center point of the golf club shaft.

14. The shaft of claim 13 wherein the taper of said intermediate section is more significant than in said tip and butt sections.

15. The shaft of claim 14 wherein the butt end includes parallel sidewalls.

16. The shaft of claim 15 wherein the tip end includes parallel sidewalls.

17. The golf club shaft of claim 13 wherein said butt end includes at least one cross-section diameter between .450 and .475 inches.

18. The shaft of claim 13, wherein the shaft has a length of between 35 and 47 inches.

19. A golf club shaft comprising:
an elongated tubular shaft, said elongated tubular shaft having a butt end comprising a substantially cylindrical cross section of relatively larger cross section having an outside diameter of between .400 and .560 inches, which transitions without intervening discontinuities to a tapered intermediate section, said tapered intermediate section transitioning without intervening discontinuities to a relatively smaller diameter tip end, said tip end having an outside diameter of between .330 and .400 inches, and said tapered intermediate section having a more significant taper than both said butt and tip ends.

20. The shaft of claim 19 wherein said tip and said butt end include parallel sidewalls.

21. A golf club shaft comprising:
an elongated tubular shaft having a length of between about 35 and 47 inches, said elongated tubular shaft having a butt end of relatively larger cross sectional diameter tapering without intervening discontinuities to a tip end of relatively smaller diameter, said tip end having an outside diameter between .330 and .400 inches;

said butt end having at least one portion with an outside diameter of between .400 and .540 inches, said butt end diameter displacing a kick point toward the butt end of the shaft.